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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/722,213      | 11/25/2003  | Kris Senecal         | NA-1174 D1          | 7033             |

7590 04/27/2006

U.S. Army Soldier and Biological  
Chemical Common  
Kansas Street  
AMSSB-OCC(N)  
Natick, MA 01760

| EXAMINER |
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TORRES VELAZQUEZ, NORCA LIZ

| ART UNIT | PAPER NUMBER |
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1771

DATE MAILED: 04/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/722,213

Applicant(s)

SENECAL ET AL.

Examiner

Norca L. Torres-Velazquez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9 and 12-14 is/are rejected.
- 7) ☒ Claim(s) 10, 11, 15 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 21406.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 14, 2006 has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 9 and 12-14 have been considered but are moot in view of the new ground(s) of rejection.

a. Independent claim 9 has been amended to further limit the polymers of the matrix polymeric material and the polymers for the conductive polymer.

The Examiner now relies on the prior art of RODRIGUEZ '499 in view of KINLEN et al. '930 (cited in previous office action), to address the present claims.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over RODRIGUEZ et al. (US 5,972,499) in view of KINLEN et al. (US 5,911,930).

RODRIGUEZ et al. discloses materials that include a bicomponent fiber, made of a nonconductive component including a first fiber forming polymer, a conductive second component, including **carbon particles** and a second fiber-forming polymer such as **cellulose acetate**, polyacrylonitrile; and a conductive third component, including a polymer selected from the group consisting of **polypyrrole** and **polyaniline**. (Abstract) The reference teaches that the invention is not only limited to fibers, but also other formed polymer articles such as fabrics and plastic sheets, and the like. The reference further teaches that the conductive polymer blend should be in solution, in dispersion in water or a solvent. (Col. 5, lines 1-12) The Examiner gives a broad definition to the term "textile" of the reference to include nonwoven fabrics. The reference teaches that the conductive polymeric fiber have a resistivity from about  $10^1$  to  $10^4$  ohms per square. (Col. 3, lines 45-47) The reference defines the term "conductive" as having a surface resistivity between  $10^0$ - $10^{11}$  ohms per square; a "highly conductive" material having a resistivity between  $10^0$ - $10^4$  ohms per square. (Col. 1, lines 18-21) Therefore, it is the Examiner's interpretation that the materials taught by the reference provide the claimed electrical conductivity. *[1 ohm =  $1.113 \times 10^{-12}$  s/cm] If for example, the material has a resistivity of  $10^4$  ohms, then it has a conductivity of  $1.113 \times 10^{-2}$  s/cm.* Based on the process of making the material taught by the reference, it is the Examiner's interpretation that the carbon particles are embedded in the fibers of the invention. With regards to the carbon particles claimed herein as nanoparticles, it is noted that the Specification of the present invention does not provide a range of values that define the term, therefore, the Examiner gives a broad interpretation and interprets the carbon particles of the prior art to read on such limitation. It is further noted that the individual filament deniers are in the range of 0.5 denier/filament up to 30 denier/filament. (Col.

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4, lines 50-51) It is noted that the fibers denier range taught by the reference includes microfibers that comprise the diameters claimed herein.

However RODRIGUEZ fails to teach that the conductive polymer is selected from the group consisting of polythiophene, polyphenol, polyacetylene and polyphenylene.

KINLEN et al. is directed to a fiber containing organic salt of an intrinsically conductive polymer distributed throughout a matrix polymer along with a method for providing such fibers by spinning a solution which includes an organic acid salt of an intrinsically conductive polymer, a matrix polymer and a spinning solvent. (Abstract) The reference teaches that the fibers of their invention have mechanical properties suitable for use in forming textile materials, i.e., fabrics made from fibers. (Col. 3, lines 9-13) The reference teaches that by intrinsically conductive polymer it is intended to include any polymer that has an electrical conductivity greater than about  $10^{-8}$  S/cm. The reference teaches that **polyaniline, polyacetylene, polyphenylene, polypyrrole, and polythiophene** are conjugated organic polymers known in the art as intrinsically conductive polymers. (Col. 4, lines 41-53) It is further noted that the reference teaches the use of cellulose acetate and polyurethanes as some of the suitable matrix polymers. (Refer to Col. 7, lines 35-42)

RODRIGUEZ discloses the claimed invention except that it uses polypyrrole or polyaniline as the conductive polymer instead of polythiophene, polyphenol, polyacetylene or polyphenylene, KINLEN shows that polythiophene, polyphenol, polyacetylene and polyphenylene are equivalent polymers known in the art. Therefore, because these materials were art-recognized equivalents at the time the invention was made, one of ordinary skill in the

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art would have found it obvious to substitute polythiophene, polyphenol, polyacetylene or polyphenylene for polypyrrole or polyaniline.

***Allowable Subject Matter***

5. Claims **15-16** and 10-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

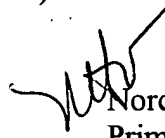
6. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach a polymer membrane article of the present invention that particularly includes the chemical indicator dyes (in a dimethyl formamide solution of polyurethane) or the photo-reactive dyes of the present invention in the claimed matrix polymeric material.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 571-272-1484. The examiner can normally be reached on Monday-Thursday 8:00-5:00 pm and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Norca L. Torres-Velazquez  
Primary Examiner  
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April 25, 2006